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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/002,483   | 11/01/2001  | Jeffrey W. Carr      | CARR-01000US2       | 2209             |
| 23910  | 7590        | 04/07/2006           | EXAMINER            |                  |
| FLIESLER MEYER, LLP<br>FOUR EMBARCADERO CENTER<br>SUITE 400<br>SAN FRANCISCO, CA 94111 |             |                      | OLSEN, ALLAN W      |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 1763                |                  |

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                             |  |
|------------------------------|--------------------------------------|-----------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/002,483 | <b>Applicant(s)</b><br>CARR |  |
|                              | <b>Examiner</b><br>Allan Olsen       | <b>Art Unit</b><br>1763     |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 30-33 and 35-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>Dec. 02, 2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 18, 2005 has been entered.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No. 6,660,177. Although the conflicting claims are not identical, they are not patentably distinct from each other. The examiner will provide a complete *Deere v Graham* type rational in the event that applicant disagrees and chooses not to submit a terminal disclaimer.

### ***Claim Objections***

Claim 22 is objected to because "...producing a volatile reaction on the surface..." should read --...producing a volatile reaction product on the surface...".

Appropriate correction is required.

Applicant is advised that should claim 28 be found allowable, claim 29 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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**Claims 1-7, 9-14, 18, 20, 22-26, 28, 29 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Takino et al. in Computer Numerically Controlled Plasma Chemical Vaporization Machining with a Pipe Electrode for Optical Fabrication, Applied Optics, Vol. 37, No. 22, pages 5198-5210 (hereinafter, Takino).**

Takino teaches a method of polishing and shaping optics with a plasma torch. Takino teaches translating and rotating the workpiece. Takino teaches the process does not damage the workpiece. Takino teaches using a gas mixture with SF<sub>6</sub> as the reactive component (precursor) and He as the carrier or plasma gas/diluent. Takino teaches a SF<sub>6</sub> flow rate of 50 ml/min. Takino teaches conducting the process at about atmospheric pressure. Takino teaches forming the volatile SiF<sub>4</sub>.

See, for example, the following excerpts,

From page 5199, left column:

“the plasma CVM method has great potential for the fabrication of superior optical surfaces because it has a high removal rate and high accuracy and does not produce damaged layers.”

“An rf plasma is generated around the tip of an electrode at a pressure almost equal to 1 atm.”

“Reaction gas is then supplied to the plasma to yield radicals of the reaction gas in the plasma. The radicals react with the workpiece surface facing the electrode, and reaction products are vaporized,”

“Furthermore, because plasma CVM uses chemical reactions, the resultant removed surfaces possess superior characteristics without damage.”

“In an environment pressurized to almost 1 atm of pressure, plasma is generated at the tip of the electrode and makes contact with the workpiece at a target position. Process gas is continuously supplied to the plasma through the pipe electrode. The process gas dissociates in the plasma to produce highly reactive radicals that react with the workpiece, thereby removing its surface. During removal the workpiece is scanned

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relative to the electrode under a computer numerically control so that the plasma moves on the workpiece surface to remove the target area. Thus we obtain the desired shape by removing the target area."

From page 5200, left column:

"The workpiece-driving system consists of a worktable, three linear driving devices ( $X$ ,  $Y$ ,  $Z$  axes), and one rotary driving device ( $R$  axis) both of which are supplied from gas bombs, are adjusted to a constant level by mass-flow controllers and are mixed in a mixer to prepare the process gas, which is then introduced into the inlet in the electrode tilting device, from where it is supplied to the electrode and then finally to the chamber."

"fluoride radicals  $F$  yielded from the  $SF_6$  react with silica glass  $SiO_2$ , and the reaction products  $SiF_4$  vaporize from a silica plate, thereby removing its surface."

"A flow rate ratio of  $SF_6$  to  $He$  was 1:99 in the process gas. After the intrachamber pressure reached a preset value, the flow rate of the process gas was set at 5 L/min."

From page 5206:

"Thus the resultant surface in the case of large-area removal is sufficiently flat and smooth for an optical surface as in the case of small-area removal."

**Claims 1-3, 5-9, 12, 14, 20, 22, 25, 29 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Zarowin et al. in Rapid Non-contact, Damage Free Shaping of Optical & Other Surfaces with Plasma Assisted Chemical Etching, 43rd Annual Symposium on Frequency Control" 1989, pages 623-626 (hereinafter, Zarowin).**

Zarowin teaches a method of treating the surface of a workpiece with a plasma torch. Zarowin teaches the treating may comprise; etching, coating, smoothing, polishing and shaping of a workpiece surface. Zarowin teaches the workpiece may comprise an optic. Zarowin teaches translating at least one of the workpiece and the plasma torch. Zarowin teaches the process causes minimal or no sub-surface damage to the workpiece. Zarowin teaches controlling the rate of the etching process by controlling the amount of gas provided to the plasma. See entire document.



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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takino as applied to claim 1 above.**

Takino does not teach the use of Ar.

It would have been obvious to one skilled in the art to replace the helium used by Takino with argon because these inert gases are both well known carrier/diluent gases for plasma processing and they are known to be functionally equivalent in this regard.

**Claims 15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takino as applied to claim 1 above and further in view of US Patent 6,218,640 issued to Selitser.**

Takino does not teach a torch comprising a plurality of concentric tubes.

Selitser teaches a plasma torch comprising a plurality of concentric tubes.

Selitser teaches providing a sheath gas to protect the central channel. Selitser teaches introducing the plasma gas tangentially (column 5, line 55 - column 6, line 15).

It would have been obvious to one skilled in the art to incorporate the nested tube configuration of Selitser because Selitser demonstrates that this provides an effective means of controlling the plasma discharge. By controlling the flow of gas through the different channels Selitser teaches that torch components can be shielded from the high temperature plasma. Selitser teaches the multi-tube torch provides a means of creating flow disturbance that results in more efficient mixing of gases and a more efficient coupling of plasma energy to the gases.

**Claims 17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takino as applied to claim 1 above and further in view of US Patent 4,674,683 issued to Fabel.**

Takino does not teach introducing a plasma gas tangentially. Takino does not teach maintaining the temperature of the plasma torch between 5000° and 15,000° C.

Fabel teaches introducing a plasma gas tangentially. Fabel teaches the temperature of plasma processes.

It would have been obvious one skilled in the art to introduce a plasma gas tangentially because Fabel teaches that provision of a tangential flow provides a degree of control over the amount of energy that is coupled into the plasma gas as well as the shape, position and length of the plasma plume (see column 5, line 55 - column 6, line 15). It would have been obvious to one skilled in the art to maintain the temperature of Takino's plasma torch process to between 5000° and 15,000° C because Fabel teaches that this is the standard temperature range for plasma processes.



**Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takino as applied to claim 1 above and further in view of US Patent 6,105,534 issued to Siniaguine et al. (hereinafter, Siniaguine).**

Takino does not teach using a plasma torch with a multiple head.

Siniaguine teaches using a plasma torch with a multiple head.

It would have been obvious one skilled in the art to use a plasma torch with a multiple head because Siniaguine teaches that this increases efficiency.

**Claims 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarowin as applied to claim 1 above and further in view of US Patent 5,961,772 issued to Selwyn.**

Zarowin does not teach introducing a plasma gas tangentially. Zarowin does not teach that the process may be used to clean a workpiece.

Selwyn teaches using a plasma torch to clean a workpiece. Selwyn teaches introducing a plasma gas tangentially.

It would have been obvious to one skilled in the art to use the plasma torch of Zarowin to clean a workpiece because, as Selwyn notes, surface cleaning is a fundamental requirement for many industrial applications and Selwyn teaches that the plasma torch is well suited to accomplish the task of cleaning. It would have been obvious one skilled in the art to introduce a plasma gas tangentially because Selwyn teaches it is beneficial to create turbulent flow dynamics and that increasing the residence time of plasma species leads to an increase in plasma density.

**Claims 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarowin as applied to claim 1 above and further in view of US Patent 4,674,683 issued to Fabel.**

Zarowin does not teach introducing a plasma gas tangentially. Zarowin does not teach maintaining the temperature of the plasma torch between 5000° and 15,000° C.

Fabel teaches introducing a plasma gas tangentially. Fabel teaches the temperature of plasma processes.

It would have been obvious one skilled in the art to introduce a plasma gas tangentially because Fabel that provision and control of a tangential flow component provides a degree of control over the amount of energy that is coupled into the plasma gas as well as the shape, position and length of the plasma plume (see column 5, line 55 - column 6, line 15). It would have been obvious to one skilled in the art to maintain the temperature of Zarowin's plasma torch process to between 5000° and 15,000° C because Fabel teaches this is a standard temperature range for plasma processes.

**Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zarowin as applied to claim 1 above and further in view of US Patent 6,105,534 issued to Siniaguine et al. (hereinafter, Siniaguine).**

Zarowin does not teach using a plasma torch with a multiple head.

Siniaguine teaches using a plasma torch with a multiple head.

It would have been obvious one skilled in the art to use a plasma torch with a multiple head because Siniaguine teaches that this increases efficiency.

### ***Response to Arguments***

Applicant's arguments filed December 27, 2005 have been fully considered. The arguments are persuasive with respect to Böhm but not so with respect to Zarowin.

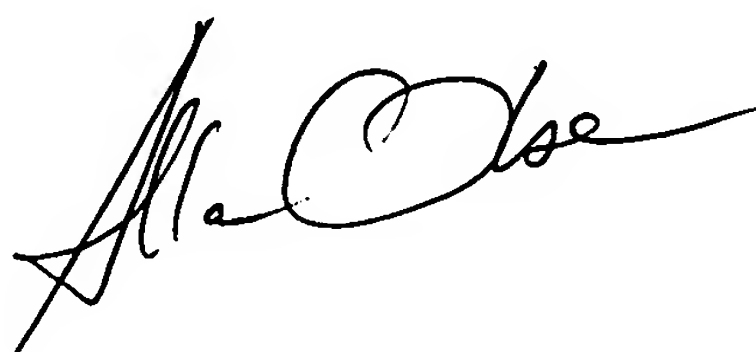
Applicant argues that claims 1 and 34 are allowable over Zarowin because the PACE method of Zarowin does not utilize a plasma torch. It is not clear why the apparatus used by Zarowin is not considered to be a torch. Applicant also points out various drawbacks of the Zarowin's PACE method. However, the differences noted by applicant are not features that are being claimed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M-F 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Allan Olsen', is written over a horizontal line.

Allan Olsen  
Primary Examiner  
Art Unit 1763